

## Super Accurate Milli-meter wave adapter

\*For details, pls look up on web site or call our sales representative.

	1.0mm W		1.85mm V		2.4mm		2.92mm K		3.5mm		SMPM		SMP	
	P	J	P	J	P	J	P	J	P	J	P	J	P	J
1.0mm W	1	2	4	6										
1.85mm V	3	5	7	9			11	12			26	27		
2.4mm	8	10			13	14			15	16	28	29		
2.92mm K					17	18			19	20	30	31		
3.5mm					21	22			23	24	32	33		
SMPM					25	26			27	28	34	35		
SMP					29	30			31	32	36	37		
					33	34			35	36	38	39		
					37	38			39	40	40	41		

1 02R0266-00 W/P-W/P  
 2 02R0267-00 W/P-W/J  
 3 02R0268-00 W/J-W/J  
 4 02R0234-00 W/P-V/P  
 5 02R0235-00 W/J-V/J  
 6 02R0233-00 W/P-V/J  
 7 02R0236-00 W/J-V/P  
 8 02R0093-10 V/P-P  
 9 02R0094-10 V/P-J  
 10 02R0095-10 V/J-J  
 11 02R0142-10 V/J-J  
 12 02R0165-10 V/P-K/J  
 13 02R0168-10 V/J-K/P  
 14 02R0166-10 V/J-K/J  
 14 02R0071-10 V/J-K/J  
 15 02R0294-00 2.4mm/P-K/P  
 16 02R0292-00 2.4mm/P-K/J  
 17 02R0293-00 2.4mm/J-K/P  
 18 02R0295-00 2.4mm/J-K/J  
 19 02R0090-10 K/P-P  
 20 02R0092-10 K/P-J  
 21 02R0091-10 K/J-J  
 21 02R0070-10 K/J-J  
 22 02R0307-00 K/P-3.5mm/P  
 23 02R0305-00 K/P-3.5mm/J  
 24 02R0308-00 K/J-3.5mm/P  
 25 02R0306-00 K/J-3.5mm/J  
 26 02R0217-00 V/P-SMPM/P  
 27 02R0219-00 V/P-SMPM/J  
 28 02R0218-00 V/J-SMPM/P  
 29 02R0220-00 V/J-SMPM/J  
 30 02R0216-00 SMPM/J-J  
 31 02R0287-00 K/P-SMPM/P  
 32 02R0286-00 K/J-SMPM/P  
 33 02R0310-00 K/P-SMPM/J  
 34 02R0311-00 K/J SMPM/J  
 35 02R0322-00 2.4mm-P-SMPM/P  
 36 02R0321-00 2.4mm/J-SMPM/P  
 37 02R0323-00 2.4mm/P-SMPM/J  
 38 02R0324-00 2.4mm/J-SMPM/J  
 39 02R0338-00 SMP/P-K/J  
 40 02R0337-00 SMP/P-K/P  
 41 02R0356-00 SMP/J-J

• We also have the adapter series of common electric lengths as below:  
 1.0mmW ↔ 1.85mmV  
 1.85mmV ↔ 2.92mmK  
 2.92mmK ↔ 3.5mm  
 SMP ↔ 2.92mmK  
 2.4mm ↔ 2.92mmK  
 2.4mm ↔ SMPM  
 1.85mmV ↔ SMPM  
 2.92mmV ↔ SMPM

## High Frequency wave adapter

\*For details, pls look up on web site or call our sales representative.

		SMP		SMA		WPL		N		TNC		BNC		SMB	
		P	J	P	J	P	J	P	J	P	J	P	J	P	J
SMP	P					2									
	J					1									
SMA	P			3	5	6	7	12	13			14	15	16	
	J	2	1	4	10	8	10	17	18			19	20	21	22
WPL	P			6	10			11				23	24		
	J			7		10	9	11							
N	P			12	17			25	27			28	29	30	
	J			13	18			27	25	31	32	33	34		
TNC	P			14	20			31	31			35			
	J			15	21			32	32						
BNC	P			16	22			33	33					36	
	J			17	23			34	34						
SMB	P			18	24										
	J			19	25										

1 02R0242-00 SMP/J-SMA/J  
 2 02R0345-00 SMP/P-SMA/J  
 3 02K2053-10 SMA/P-P  
 3 02K2054-10 SMA/P-P  
 4 02K2055-10 SMA/J-J  
 4 02K2056-00 SMA/J-J  
 4 02R0009-00 SMA/J-J  
 5 02K2057-10 SMA/P-J  
 5 02K2115-00 SMA/P-J  
 5 02K2117-00 SMA/P-J  
 5 02K0907-00 SMA/P-J  
 6 02K2516-00 SMA/P-WPL/P  
 7 02K2501-00 SMA/P-WPL/J  
 8 02K2521-00 WPL/P-P  
 9 02K2646-00 WPL/J-J  
 9 02K2518-00 WPL/J-J  
 10 02K2517-00 WPL/P-J  
 11 02K2735-00 WPL/J-N/P  
 12 02K2058-00 SMA/P-N/P  
 13 02K2059-00 SMA/P-N/J  
 13 02R0113-00 SMA/P-N/J  
 14 02K2224-00 SMA/P-TNC/J  
 15 02K2225-00 SMA/P-BNC/P  
 16 02K2126-00 SMA/P-BNC/J  
 17 02K2061-00 SMA/J-N/P  
 18 02K2062-00 SMA/J-N/J  
 18 02R0046-00 SMA/J-N/J  
 19 02K2063-00 SMA/J-TNC/P  
 19 02R0013-00 SMA/J-TNC/P  
 20 02R0007-00 SMA/J-TNC/J  
 21 02K2065-00 SMA/J-BNC/P  
 22 02K2125-00 SMA/J-BNC/J  
 23 02R0049-00 SMA/J-SMB/P  
 24 02R0048-00 SMA/J-SMB/J  
 25 02K2066-00 N/P-P  
 26 02K1430-10 N/J-J  
 26 02R0246-00 N/J-J  
 27 02K2069-00 N/P-J  
 27 02K2070-00 N/P-J  
 28 02K2226-00 N/P-TNC/J  
 29 02K2072-00 N/P-BNC/P  
 30 02K2073-00 N/P-BNC/J  
 31 02K2074-00 N/J-TNC/P  
 32 02K2227-00 N/J-TNC/J  
 33 02K2228-00 N/J-BNC/P  
 34 02K2229-00 N/J-BNC/J  
 35 02K2076-00 TNC/J-J  
 36 1821K079-00 BNC/J-J

## WPL Connector

DC~18GHz

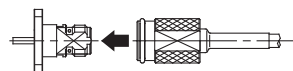
Waka Patent approved

### The unique way of engagement

#### Easy engagement

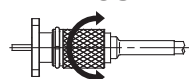
Step 1 : Push the receptacle-H cut part into the plug coupling Rorret Cut Part

Push!



Step 2 : Revolve the coupling by 90° to lock. (either clockwise or counterclockwise)

Lock!



### Typical specification

(Rec)= Receptacles

	capability
Impedance	50Ω
Frequency Range	DC~18GHz*
V.S.W.R.	≤1.2 at 18GHz (Rec)
Insertion Loss	≤0.15dB at 18GHz (Rec)
Insulation Resistance	DC500V Min 5000MΩ (Rec)
Dielectric Withstanding Voltage	AC1000V.rms at Sea Level
Contact Resistance	AC50mA : Max3mΩ
Coupling nut Retention	Min50N
Resistable engagement times	500
Operating temperature range	-55~125°C
Applicable cables	Semi Rigid, Semi Flexible*

\*Semi flexible cables : applicable frequency range

### Receptacles

Jacks

01K2493-10  
 01K2526-10  
 01K2525-00  
 01K2550-00  
 01K2580-00  
 01K2744-00

SMD Type 10GHz

### Cable assemblies



Applicable cables  
 Semi Rigid : SX-22, SX-36  
 Semi Flexible : SXL-22, SXL-36  
 Flexible : 1.5D-2V

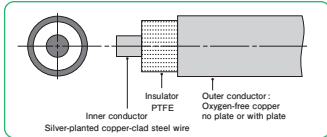
\*Soft Rigid Cable is also applicable

### Convertible adapters (for SMA)

02K2501-00 SMA/P-WPL/J  
 02K2517-00 WPL/P-SMA/J  
 02K2516-00 WPL/P-SMA/P  
 02K2735-00 WPL/J-N/P

# Semi-Rigid cable

## Structure



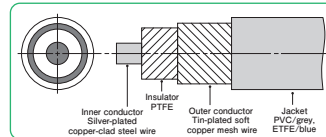
## Typical specification

	SX-36 (0.141")	SX-22 (0.085")	SX-12 (0.047")	SX-09 (0.034")
Impedance (Ω)	50±0.5	50±1.0	50±2.0	50±2.5
Outer conductor diameter (mm)	3.581±0.025	2.197±0.025	1.194±0.025	0.864±0.025
Inner conductor diameter (mm)	0.919±0.017	0.511±0.013	0.287±0.012	0.203±0.012
Insulator diameter (mm)	2.985±0.051	1.676±0.051	0.940±0.025	0.660±0.025
Capacitance (pF/m)	95	95	95	95
Insulation dielectric strength (VRMS)	5000	2500	2000	2000
Corona generating voltage (VRMS)	2000	1500	1000	750
Higher order mode (GHz)	33	62	117	157
Wave length shortening (%)	70	70	70	70
The minimum bending radius (mm)	6.5	3.0	3.2	3.2
Weight (g/m)	46.0	20.0	6.7	3.9
The highest temperature (°C)	125	125	125	125

Attenuation/ Electric Power Capacity (dB/1m)/(W) (20°C, sea level)	Frequency (GHz)	0.5	1.0	5.0	10.0	20.0	30.0	40.0	50.0	60.0
		0.24/600	0.34/450	0.84/180	1.25/120	1.90/70	2.45	4.57	5.25	5.85
		0.42/180	0.60/130	2.06/36	3.04/20	3.85	4.57	5.25	5.85	
		0.70/45	1.05/32	3.50/9	5.00/6.5	6.35	7.45	8.45	9.40	
		1.05/14	1.50/10	3.40/4.5	4.90/3.2	8.70	10.20	11.55	12.80	

# Semi-Flexible cable

## Structure



## Attenuation

### Jacket types

Example) SXL-36□□□  
 "2 spaces" means "without a jacket"  
 F...Material : ETFE (Blue) 90°C (UL)  
 FP...Material : PVC (Grey) 105°C (UL)

\*The standard jacket is FP.

\*Applicable cables stay the same, regardless of a type of jacket.

## Typical specification

	Normal type		
	SXL-36, 36F, 36FP	SXL-22, 22F, 22FP	SXL-12F
Impedance (Ω)	50±1.0	50±1.0	50±2
Outer conductor diameter (mm)	3.50±0.1	2.1±0.1	1.15±0.1
Inner conductor diameter (mm)	0.930±0.010	0.511 <sup>+0.010</sup> <sub>-0.005</sub>	0.287 <sup>+0.010</sup> <sub>-0.005</sub>
Insulator diameter (mm)	2.90 <sup>+0.08</sup> <sub>-0.06</sub>	1.58 <sup>+0.04</sup> <sub>-0.06</sub>	0.9 <sup>+0.06</sup> <sub>-0.03</sub>
Capacitance (pF/m)	98	98	98
Insulation dielectric strength (VRMS)	3000	3000	3000
Corona generating voltage (VRMS)	2000	1500	1000
Higher order mode (GHz)	35	62	113
Wave length shortening (%)	70	70	70
The minimum bending radius (mm)	8.0	5.0	3.0
Weight (g/m)	44.4	17	5.5

Attenuation (dB/1m) (20°C, sea level)	Frequency (GHz)	0.5	1.0	5.0	10.0	20.0
		0.2	0.45	1.11	1.74	2.44 (18GHz)
		0.4	0.79	1.83	2.71	3.85 (18GHz)
		0.90	1.27	2.92	4.30	6.00 (18GHz)

# Flexible Cable Assy DC~110GHz

## Overview

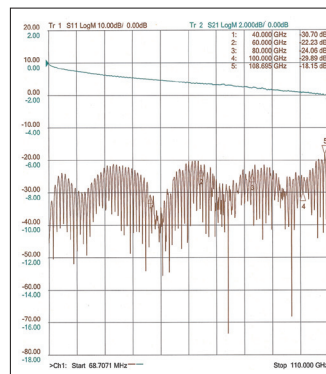
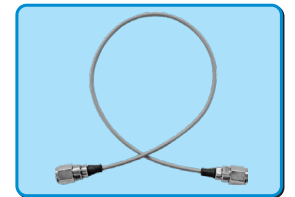
Now flexible cable with 1.00mmW connectors is available and adding to our line-up.

## Features

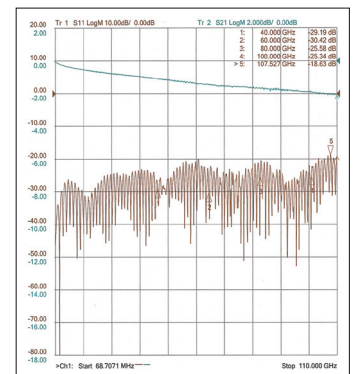
Cable is Soft and flexible. Length is fully adjustable for assembly.

## Application

Connecting internal and external layout for millimeter wave signals

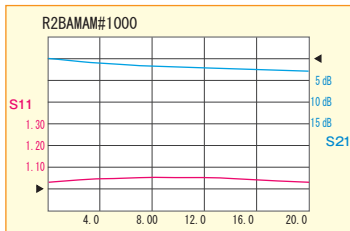


■ 1.0mm W/P-P



■ 1.0mm W/P-J

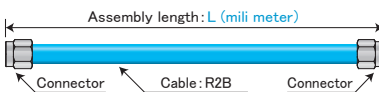
# Soft Rigid cable (Our original cable for measurement use) DC~65GHz



## Model No.

Example : Soft-rigid (SP-20R) both ends SMA / P. L 1m

R2B AM AM # 1000  
 Cable-type Connector Connector L dimension (mm)



A = SMA	V = 1.85mmV
Q = 3.5mm	H = WPL
K = 2.92mmK	N = N type
C = 2.4mm	

\*Standard lengths  
 300•500•700•1000•1500•  
 2000•3000•4000•5000 (mm)

## Typical specification

Model No.	R2B AM AM # 1000	R2B AM AL # 1000	R2B KM KM # 1000	R2B VM VM # 1000
Applicable cable	R2B (SP-20R)			
Impedance	50Ω			
Standard Insertion loss at 10GHz	1.8dB	1.8dB	1.8dB	1.8dB
Standard Insertion loss at 18GHz	3.0dB	3.0dB	3.0dB	3.0dB
Standard Insertion loss at 40GHz	-	-	3.9dB	3.9dB
Standard Insertion loss at 65GHz	-	-	-	4.9dB
V.S.W.R.	1.2 (at 18GHz)		1.35 (at 40GHz)	1.35 (at 65GHz)
Outer conductor	Oxygen-free seamless copper pipe			
Inner conductor	Silver-plated copper-clad steel wire			
Insulator	Low loss PTFE			
Outer sheath	polyolefin			
Operating temperature range	-55~105°C			
Outer sheath diameter	φ6.3mm			
Outer sheath color	Blue			
Connectors	SMA/P	SMA/LP	2.92mmK/P	1.85mmV/P
Minimum bending radius	40mm			

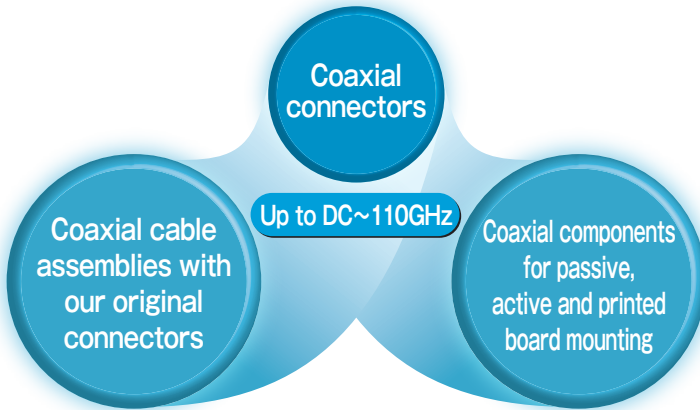
## Typical specification

Model name	02W2641#□□□□	02W2613#□□□□	02W2647#□□□□	02W2647#□□□□
Cable model NO.	SWF-12			
Characteristic impedance	50±1Ω			
Applicable frequency (GHz)	DC ~ 65		DC ~ 110	
V.S.W.R.	1.25 (20GHz), 1.4 (40GHz), 1.6 (60GHz)		1.3 (40GHz), 1.4 (70GHz), 1.6 (110GHz)	
Outer sheath	FEP (Blue)			
Outer conductor II	Silver plated braided copper			
Outer conductor I	Flat wire (silver plated copper)			
Insulator	FEP (Natural color)			
Inner conductor	silver plated copper - clad steel wire			
Outer sheath diameter (mm)	1.47±0.2-0.1			
Operating (conservation) temperature range	- 55 ~ 125°C			
Connector used	1.85mmV/P-P	1.85mmV/P-J	1.0mmW/P-P	1.0mmW/P-J
Minimum flexing radius	5.1mm			

## Corporate vision

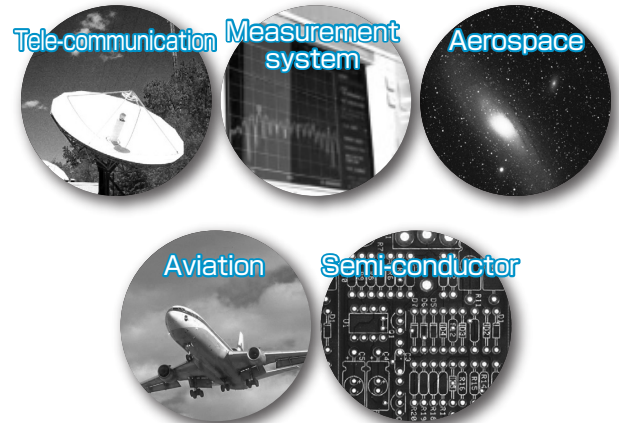
### Focus on Micro Wave Business

We are winning our competitive edge in the area of the high frequency wave connectors and are continuing to offer our original components & devices to meet your needs.



### Global Business Development

We provide you with the best solution services in the area of Micro wave business with our world-wide vertical production network.



## Facilities

Tokyo Head Office



Omi Plant



Matsumoto Plant



#### Head Office

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Nagano 399-7104, JAPAN  
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## Corporate Profile

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■ URL	<a href="http://www.waka.co.jp">http://www.waka.co.jp</a>
■ Established	April, 1958
■ Capital	¥23,000,000
■ Fiscal year end	September
■ C.E.O.	Yoshinosuke Wakabayashi
■ Business domain	<ul style="list-style-type: none"> <li>● Micro Wave Coaxial Business                             <ul style="list-style-type: none"> <li>• Milli-meter wave connector • Micro wave connector</li> <li>• Coaxial cable • Micro wave components</li> </ul> </li> <li>● Digital Interface Business                             <ul style="list-style-type: none"> <li>• Connector • Cable • Radio frequency components</li> </ul> </li> <li>● Lithium Ion Battery Business</li> <li>● Machining Business</li> </ul>
■ Banks	Sumitomo Mitsui Banking Corporation Hatanodai Branch The Hachijuni Bank Co.,Ltd. Akashina Branch Mizuho Bank Co.,Ltd. Iidabashi Branch
■ Clientele	ADVANTEST CORPORATION ALPS ELECTRIC CO.,LTD. ANRITSU CORPORATION OKI ELECTRIC INDUSTRY CO.,LTD. KEYSIGHT TECHNOLOGIES,INC. CANON INC. SUMITOMO ELECTRIC DEVICE INNOVATIONS INC. SONY CORPORATION TDK CORPORATION TOKYO KEIKI INC. TOSHIBA CORPORATION NEC CORPORATION NIPPON TELEGRAPH AND TELEPHONE CORPORATION JAPAN RADIO CO.,LTD. HITACHI CO.,LTD. HITACHI HEALTHCARE COMPANY FUJITSU CO.,LTD. PANASONIC CORPORATION MITSUBISHI ELECTRIC CORPORATION MURATA MANUFACTURING CO.,LTD.
■ Agencies	WAVEPARTS SHANGHAI FINTECH TECHNOLOGY DEVELOPMENT CO., LTD CASTLE MICROWAVE LTD MILLIMETRIC RF & MICROWAVE COMPONENTS TACTRON ELEKTRONIK GMBH & CO. KG OKAMOTO ELECTRONICS CORPORATION. KAKUTA RADIO ELECTRONIC CO.,LTD. KYORITSU DENGYO CO.,LTD. KONO ELECTRONICS CO.,LTD. SUMIDEN SHOJI CO.,LTD. SEVENSIX INC. DAITRON CO.,LTD. TOA MUSENDEKI CO.,LTD. NIHON DENKEI CO.,LTD. HOEI DENKI CO.,LTD. RYODEN TRADING CO.,LTD.